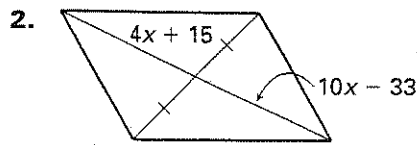
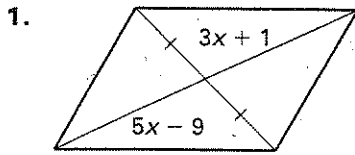




For what value of  $x$  is the quadrilateral a parallelogram?

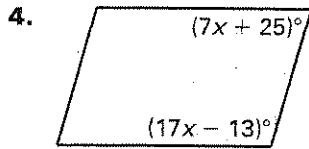


①  $3x + 1 = 5x - 9$

$10 = 2x$   
 $5 = x$

②  $4x + 15 = 10x - 33$

$48 = 6x$   
 $8 = x$



$7x + 25 + 17x - 13 = 180$   
 $24x + 12 = 180$   
 $24x = 168$   
 $x = 7$

Decide whether you are given enough information to determine that the quadrilateral is a parallelogram.

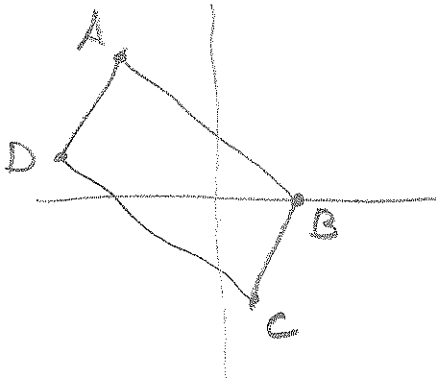
- 7. Opposite sides are parallel. **NO**
- 9. Two pairs of consecutive sides are congruent. **NO**
- 11. Diagonals are congruent. **Yes**
- 13. All four sides are congruent. **Yes**



Prove that the points represent the vertices of a parallelogram. Use the method indicated.

15.  $A(-4, 7), B(3, 0), C(2, -5), D(-5, 2)$ ;

using diagonals bisect each other



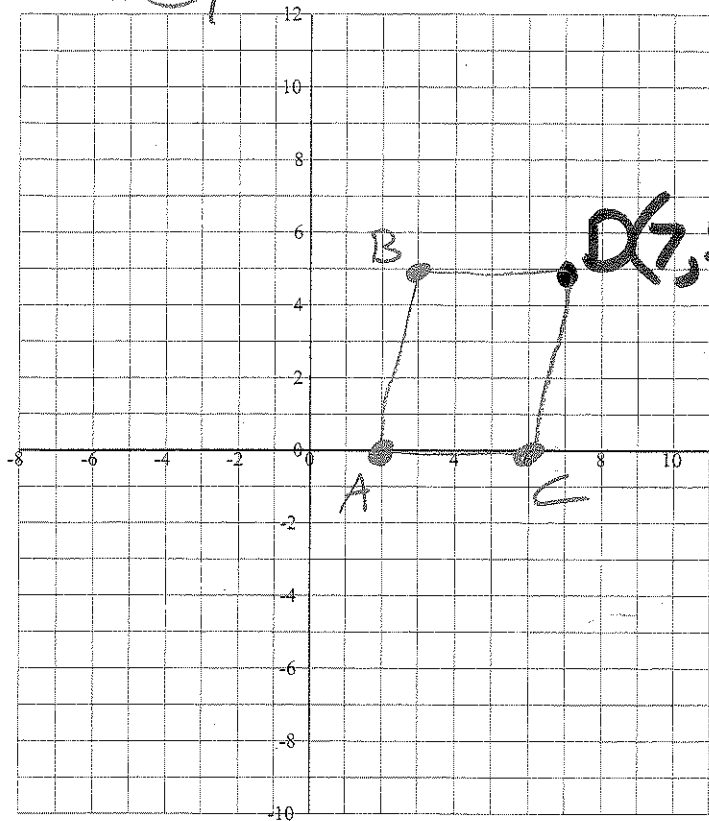
Midpt of  $\overline{AC} = \left( \frac{-4+2}{2}, \frac{7+(-5)}{2} \right) = (-1, 1)$

midpt of  $\overline{BD} = \left( \frac{3+(-5)}{2}, \frac{0+2}{2} \right) = (-1, 1)$

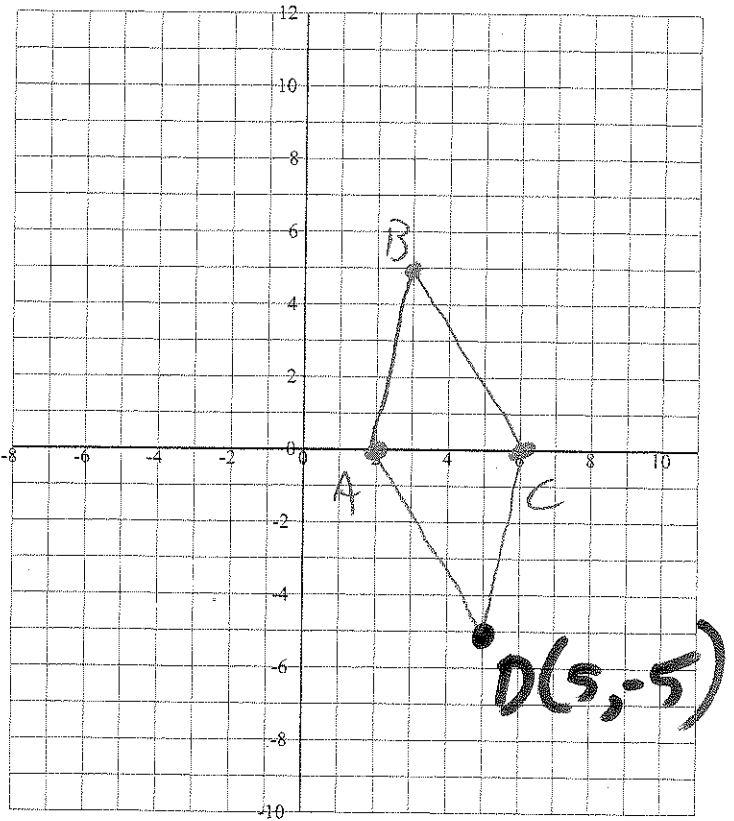
Same midpoint  $\Rightarrow$  diagonals bisect each other  $\Rightarrow$

Parallelogram

#31



or



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or

